

REMARKS

Claims 1, and 3-9, as amended, remain in the case.

1. Applicants thank the Examiner for the courteous interview granted their attorney on December 15, 2003. The substance of arguments presented on behalf of applicants at the interview appears below.

2. Claims 1-8 were rejected under 35 U.S.C. 102(b) as anticipated by Hirano et al. '321 (US Pat. 5,561,321). Claim 1 is amended to incorporate the limitation of now canceled claim 2. The rejection of these amended claims is respectfully traversed.

The present invention relates to an adhesive composition for bonding two or more kinds of different members. The composition is made of a brazing material and a particulate material that reduces thermal stress. In another embodiment, the invention relates to a composite member that is made of two or more kinds of different members that have differing thermal stress values. The different members are bonded with the adhesive material described above.

The adhesive composition bonds two or more kinds of different members. The composition, due to its makeup, maintains a proper bonding strength without causing a phenomenon, due to thermal stress formed during the cooling operation after bonding at high temperatures, of reduction in bond strength at or around the bonded interface, or the occurrence of cracks at those members that are easily damaged by thermal stress during a cooling operation. The resulting product is a composite member formed of members bonded using the claimed adhesive composition. There is no teaching of this unique adhesive composition or the resulting composite product in Hirano et al. '321.

Before discussing Hirano et al. '321, applicants discuss two points raised by the Examiner and noted in the Interview Summary.

a) Transitional Phrase

The Examiner considered the transitional phrase "comprising" in claim 1 to be too broad, permitting the claim to encompass even the alumina layer 16 in Fig. 6 of Hirano et al. '321. Applicants' attorney suggested replacing "comprising" with "consisting essentially of" to indicate clearly that such a

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ceramic layer was not intended to be claimed. The Examiner then said that the U.S. PTO Board of Patent Appeals and Interferences prefers use of the term "consisting of" rather than "consisting essentially of." The Examiner cited two cases in support of what she believes to be the Board position.

Ex parte Davis et al, 80 USPQ 448 (Bd. Pat. App 1948)

The phrase "consisting essentially of" limits the claim to the specified ingredients and those that do not affect the basic and novel characteristics of the composition.

In re De Lajarte, 143 USPQ 256 (CCPA 1964)

When a applicant contends that modifying components in the reference composition are excluded by the recitation of "consisting essentially of," the applicant has the burden of showing that the basic and novel characteristics of the claimed composition i.e. a showing that the introduction of these modifying components of the reference would materially change the characteristics of applicant's claimed composition.

Transitional phrases are discussed in MPEP 2111.03. The Manual basically confirms the above interpretation of

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"consisting essentially of" but noting that "materially affect" is the proper consideration citing *In re Herz*, 190 USPQ 461, 463 (CCPA 1976). Similarly, the Manual also quotes *In re De Lajarte* for the same concept as follows:

If an applicant contends that additional steps or materials in the prior art are excluded by the recitation of "consisting essentially of," applicant has the burden of showing that the introduction of additional steps or components would materially change the characteristics of applicant's invention.

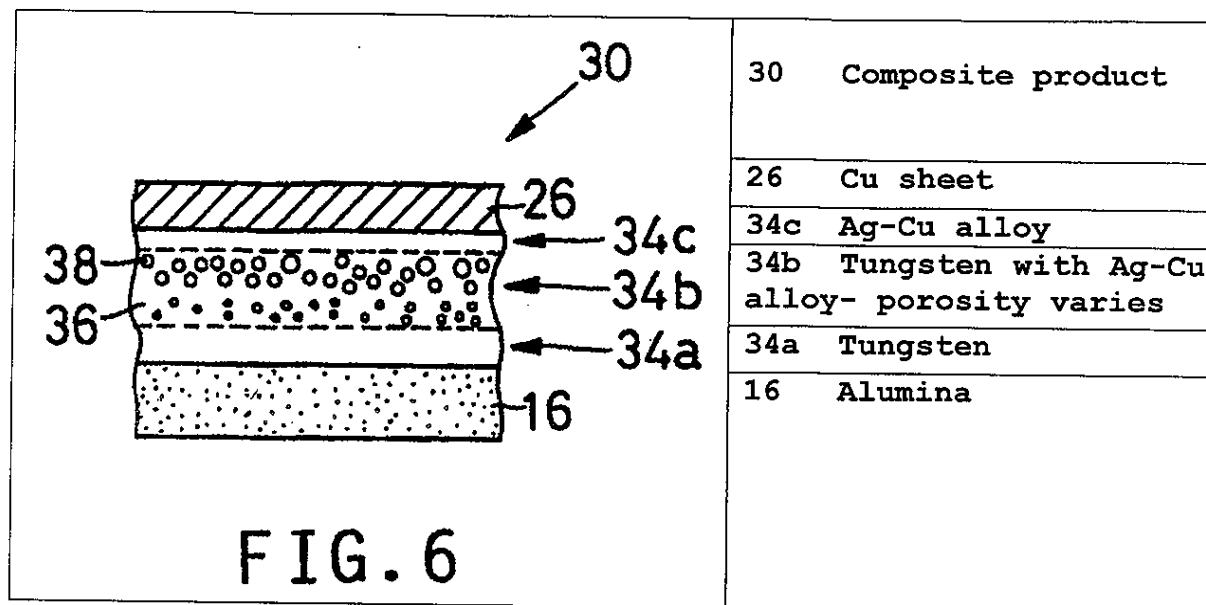
Applicants read these comments in MPEP 211.03 to mean there is no need to use "consisting of" as long as applicants here can show that the introduction of the additional component 16 of *Hirano et al. '321* would materially affect the characteristics of applicants' invention. Because applicants' invention is a two component adhesive composition made of a brazing material and a particulate material, the addition of a solid layer 16 in *Hirano et al. '321* would materially affect and change the nature of the adhesive composition. Accordingly, the use of "consisting essentially of" (or in this case the correct grammatical form

"consists essentially of") is a proper transitional phrase which distinguishes patentably the invention over the Hirano et al. '321 structure/composition as discussed further below.

b) Homogeneous or uniform mixture

During the discussion of Hirano et al. '321 at the interview, the required gradient nature of layer 34b in Fig. 6 in the final product was contrasted with a uniform mixture of just solder and particulate material in applicants' adhesive composition and resulting binder layer. See the discussion in the specification at page 5, lines 8-13, where the brazing material and the particulate material are said usually to be mixed before use. This mixing would result in a uniform mixture as an artisan in this field would recognize. Accordingly, claim 1 has been amended to state that the mixture of the two ingredients is uniform and thus not in a gradient form as depicted in Hirano et al. '321.

Hirano et al. '321 discloses a ceramic-metal composite structure illustrated in Fig. 6, copied below with right side legends added.



The composite substrate 30 is made of an alumina substrate 16, a metallic layer 34, and a copper sheet 26 bonded to the alumina substrate 16 via the metallic layer 34.

The metallic layer 34 has three sub-layers.

1. The lower tungsten sub-layer 34a has a low coefficient of thermal expansion.

2. The middle layer is a tungsten/silver-copper alloy mixture sub-layer 34b having an intermediate coefficient of thermal expansion.

3. The top silver-copper alloy sub-layer 34c has a higher coefficient of thermal expansion.

In the middle sub-layer 34b, the ratio of the percentage content of the silver-copper alloy to the tungsten content increases with distance from the alumina substrate 16 (col. 9, line 66, to col. 10, line 4). Thus, in layer 34b in Fig. 6, circles 38 denote the Ag-Cu alloy and the larger circles (i.e. the higher concentrations) are at the top, indicating that the higher percentage content of the silver-copper alloy is at the top rather than at the bottom, which has the highest concentration of tungsten (col. 9, lines 5-11). As explained in col. 23, lines 9-17, the purpose of continuously changing the ratio of the percentage of the Ag-Cu alloy and the high melting metal (e.g. Tungsten) is to reduce the thermal stress.

Thus, the "adhesive composition" 34 in Hirano et al. '321 is not a simple composition of a brazing material and a particulate material that reduces thermal stress, but rather is a complex three-layer material system requiring a top layer 34c of Ag-Cu alloy, a bottom layer 34a of tungsten, and a middle layer 34b having a mixture of tungsten and an Ag-Cu alloy where the two components are arranged in a gradient concentration, see Fig. 6.

There is no teaching of the adhesive composition of amended claim 1 which "consists essentially of" a uniform mixture of a brazing material and a particulate material to reduce thermal stress without the required top and bottom layers 34a and 34c and where:

a) the base metal for the brazing material is Au, Ag, Cu, Pd, Al or Ni, and

b) the particulate material is either a ceramics fine particle, a cermet fine particle, or a low-expansion metal fine particle.

In the Response to Augments section of the Office Action, the statement is made that "adhesive composition" has been given no patentable weight because a preamble is generally not accorded any patentable weight. The Examiner's attention is directed to MPEP 2111.02 "Effect of Preamble." The first sentence of that section reads:

The determination of whether a preamble limits a claim is made on a case-by-case basis in light of the facts in each case; there is no litmus test defining when a preamble limits the scope of a claim.

Later in that section the following passage appears:

During examination, statements in the preamble reciting the purpose or intended use of the claimed invention must be evaluated to determine whether the recited purpose or intended use results in a

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structural difference (or, in the case of process claims, manipulative difference) between the claimed invention and the prior art. If so, the recitation serves to limit the claim.

Here the phrase "adhesive composition" structurally (and patentably) distinguishes the invention from the structure in Hirano et al. '321 where the alumina layer in Fig. 6 is part of the ceramic-metal composite structure to be bonded together and not part of a bonding composition as claimed in claim 1.

Accordingly, review and withdrawal of this rejection are requested.

3. Claim 9 stands rejected under 35 U.S.C. 103(a) as unpatentable over Hirano et al. '321 for the reasons stated in section 4 of the Office Action. This rejection is traversed.

The Examiner admits that Hirano et al. '321 does not disclose the composite member for gas separation tubes. Because as discussed above, the reference fails to disclose the composite member of claim 4 with its unique two-component adhesive composition, the reference also fails to teach the composite member of claim 9. Accordingly, review and withdrawal of this rejection are also requested.

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Applicants respectfully submit that the present application is now in condition for allowance. Accordingly, the Examiner is requested to issue a Notice of Allowance for all pending claims.

Should the Examiner deem that any further action by the applicants would be desirable for placing this application in even better condition for issue, the Examiner is requested to telephone applicants' undersigned representative at the number listed below.

Respectfully submitted,

PARKHURST & WENDEL, L.L.P.

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Date

CAW/EC/ch

Charles A. Wendel

Charles A. Wendel

Registration No. 24,453

Attorney Docket No. WATK:178A
PARKHURST & WENDEL, L.L.P.
1421 Prince Street, Suite 210
Alexandria, VA 22314-2805
Telephone: (703) 739-0220